

Amendments to the Claims

This listing of the claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A multi-stage circuit having a first stage and a second stage, the first stage having an output switch and an amplifier with an amplifier output, the second stage having an input switch in communication with the output switch, the multi-stage circuit comprising:
 - a bootstrap module in communication with both the output switch and the input switch, the bootstrap module being capable of applying a voltage to both the input and output switches, the applied voltage ensuring that the first and second switches remain in an on state at specified times, the bootstrap module capable of receiving an input voltage at an input, the bootstrap module having an output to provide the applied voltage, the bootstrap module including a transmission gate ~~complementary switch~~ that electrically communicates the input with the output,
 - a common node between the input switch and output switch, the amplifier output coupled to the common node such that there is no intervening switch between the amplifier output and the common node.
2. (Previously Presented) The multi-stage circuit as defined by claim 1 wherein the input and output switches are controlled to operate at the same phase and duty cycles.
3. (Original) The multi-stage circuit as defined by claim 1 wherein during the specified times, the applied voltage is no less than a minimum turn on voltage required to turn the first and second switches to the on state.
4. (Cancelled)
5. (Currently Amended) The multi-stage circuit as defined by claim 1 wherein the bootstrap module includes a charge storage element, the charge storage element being capable of storing a constant voltage, the transmission gate ~~complementary switch~~ coupling the input with the charge storage element to produce the applied voltage at the output.

6. (Original) The multi-stage circuit as defined by claim 1 further including:
a buffer coupled with the bootstrap module.
7. (Original) The multi-stage circuit as defined by claim 1 wherein the first stage and second stage comprise a switched capacitor circuit.
8. (Currently Amended) A multi-stage switched capacitor circuit comprising:
a first stage having an output switch and an amplifier with an amplifier output;
a second stage having an input switch in communication with the output switch of the first stage; and
a bootstrap module coupled between both the output switch and the input switch, the bootstrap module being capable of applying the same voltage to both the output switch and the input switch, the bootstrap module capable of receiving an input voltage at an input, the bootstrap module having an output to provide the applied voltage, the bootstrap module including a transmission gate ~~complementary switch~~ that electrically communicates the input with the output;
a common node between the input switch and output switch, the amplifier output coupled to the common node such that there is no intervening switch between the amplifier output and the common node.
9. (Original) The multi-stage switched capacitor circuit as defined by claim 8 wherein the first stage also includes a feedback loop coupled with the output switch.
10. (Previously Presented) The circuit as defined by claim 9 wherein the output switch and the input switch are controlled to operate with the same phase and duty cycle.
11. (Previously Presented) The circuit as defined by claim 8 further including a buffer coupled to the bootstrap module.
12. (Cancelled)

13. (Original) The circuit as defined by claim 8 wherein the voltage applied to the input switch is no less than a minimum turn on voltage required to turn the input switch to the on state.

14. (Original) The circuit as defined by claim 8 wherein the wherein the first stage includes a SHA, and the second stage includes an MDAC.

15. (Currently Amended) A multi-stage switched capacitor circuit comprising:

a first stage having a first stage input, a first stage output, and an output feedback loop feeding the first stage output back to the first stage input, the output feedback loop including an output switch, the output switch when in an off state interrupting the output feedback loop;

a second stage having an input switch, the input switch in communication with the output feedback loop of the first stage; and

means for applying a bootstrap voltage to the output switch and the input switch, the bootstrap voltage maintaining the input switch and the output switch in an on state during a specified time interval, the applying means capable of receiving an input voltage at an input, the applying means having an output to provide the applied voltage, the applying means including a transmission gate ~~complementary switch~~ for electrically communicating the input with the output.

16. (Cancelled)

17. (Cancelled)

18. (Previously Presented) The circuit as defined by claim 15 wherein the output switch and the input switch are controlled to operate with the same phase and duty cycle.

19. (Cancelled)

20. (Previously Presented) The circuit as defined by claim 15 wherein the first stage includes a SHA, and the second stage includes an MDAC.

Claims 21-28 (Cancelled)

29. (Previously Presented) The multi-stage circuit as defined by claim 1 wherein a control signal controls the duty cycles of the input and output switches, the input and output switches being controlled to turn on during every rising edge of the control signal.

30. (Cancelled)

31. (Cancelled)

32. (Currently Amended) A multi-stage circuit having a first stage and a second stage, the first stage having an output switch, the second stage having an input switch in communication with the output switch, the multi-stage circuit comprising:

a bootstrap module in communication with both the output switch and the input switch, the bootstrap module being capable of applying a voltage to both the input and output switches, the applied voltage ensuring that the first and second switches remain in an on state at specified times, wherein the bootstrap module is capable of receiving an input voltage at an input, the bootstrap module having an output to provide the applied voltage, the bootstrap module including a transmission gate ~~complementary switch~~ that electrically communicates the input with the output.

33. (Previously Presented) The multi-stage circuit as defined by claim 32 wherein the input and output switches are controlled to operate at the same phase and duty cycles.

34. (Previously Presented) The multi-stage circuit as defined by claim 32 wherein during the specified times, the applied voltage is no less than a minimum turn on voltage required to turn the first and second switches to the on state.

35. (Currently Amended) The multi-stage circuit as defined by claim 32 wherein the bootstrap module includes a charge storage element, the charge storage element being capable of storing a constant voltage, the transmission gate ~~complementary switch~~ coupling the input with the charge storage element to produce the applied voltage at the output.

36. (Previously Presented) The multi-stage circuit as defined by claim 32 further including:

a buffer coupled with the bootstrap module.

37. (Previously Presented) The multi-stage circuit as defined by claim 32 wherein the first stage and second stage comprise a switched capacitor circuit.